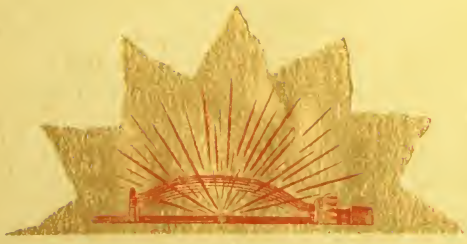
Second...
Edition....



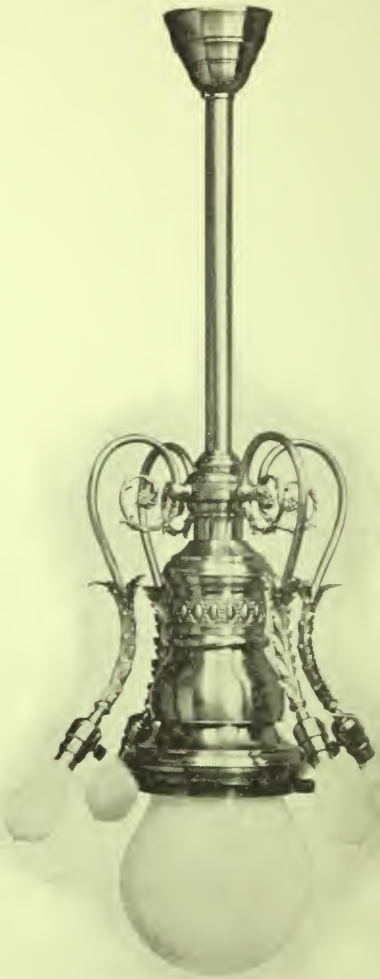


Fig. A.

JANDUS ENCLOSED ARC LAMPS

FOR ALL CIRCUITS.

CONSTANT POTENTIAL
CONSTANT CURRENT
RAILROAD AND POWER
ALTERNATING
220 VOLT
SHORT TYPES
ORNAMENTAL TYPES

THE JANDUS ELECTRIC COMPANY,
Cuyahoga Building, CLEVELAND.

FIG. 1

FIG. 2.

THE JANDUS DOUBLE ENCLOSED ARC LAMPS

Manufactured under Patents of WM. JANDUS, GEO. R. LEAN, and others.

ONE HUNDRED AND FIFTY HOURS BURNING FROM A SINGLE HALF-INCH CARBON. A single carbon only is used to trim the lamp, as the unconsumed portion of the upper carbon is used for the lower after the first trimming.

LAMPS BURNING SINGLY with economy on 110 or 220 volt circuits, thus avoiding the inconvenience of placing two lamps in series.

PERFECT DIFFUSION OF LIGHT obtained by the use of double alabaster globes, doing away with all shadows both on the globe and above and beneath the lamp.

DOES NOT DEADEN THE ATMOSPHERE like an open arc when burning in closed rooms.

UNIFORM DISTRIBUTION OF LIGHT over a given area, produced by the long arc.

NEAREST APPROACH TO COLOR OF DAYLIGHT yet produced by artificial light.

ABSENCE OF ALL FLICKER while burning.

DANGER PROOF AGAINST FIRE rendered by the double enclosure.

ABSOLUTELY NOISELESS IN OPERATION.

FEWNESS OF WORKING PARTS; DECREASE IN THE COST OF REPAIRS.

ABSENCE OF ALL DIRT FROM TRIMMING.

QUICKEST LAMP TO TRIM AND NEEDS TRIMMING LESS FREQUENTLY than any other, thus SAVING FLOOR SPACE.

BURNS OUT-DOORS WITHOUT A HOOD.

ENTIRE MECHANISM CONCENTRIC TO CENTRAL STEM.

SUSCEPTIBLE TO ARTISTIC DESIGN.

SMALL IN DIMENSIONS.

The John Scott medal was awarded by the City of Philadelphia to Wm. Jandus upon the recommendation of the Franklin Institute, May 1, 1895, for advance in the art of arc electric lamps as manufactured by The Jandus Electric Company.

THE JANDUS ENCLOSED ARC LAMP.

The success of the Jandus Double Enclosed Arc Lamp, both in this country and throughout Europe, during the past four years, has demonstrated the practicability of the enclosed arc for all conditions of arc lighting.

The application of the double globes enclosing the arc as arranged in the Jandus Lamp has completely revolutionized the arc lighting industry and represents the greatest advance that has been made in the art of lighting since the introduction of the commercial arc lamp in 1878.

While the Jandus Lamp has many prominent features distinctly its own, brought about by the necessity of making a special structure to accomplish the results in view, the surrounding of the carbons with the enclosures is most important.

One of the advantages of the double globes is the length of the arc that can be maintained. On circuits of from 100 to 120 volts, the D. P. of arc is about 80 volts. The above D. P. is approximately twice that of the ordinary open arc and obviates the necessity of operating two lamps in series on ordinary circuits for incandescent lamps.

Another great advantage of the double globes is the diffusion of light thus obtained and its even distribution in all directions, casting no shadows on the globe or above and beneath the lamp. This diffusion is further augmented by the long arc that can be maintained in the enclosure. The combined diffusion caused by the two globes and the length of the arc serves to throw the light more uniformly over the space lighted than has heretofore been possible. Instead of a powerful light being thrown within a small radius of the lamp, the light is distributed over a larger area to

much better advantage. On page 12 we print from *The Electrician*, published in London, a test showing comparative measurements between the open air arc and the Jandus Lamp.

Another distinct advantage is the color of the light produced by the long arc which is free from the yellow rays of the short arc lamp and more nearly resembles daylight than any light heretofore produced, and can be changed to almost any shade by the different combinations of the inner and outer globes. This adaptability is very valuable when it is desirable to match delicate colors, and thus the lamps have become very popular where such requirements arise, as in dry goods houses, millinery establishments, etc.

That there can be no possible competition between the enclosed arc lamps and the old open air type is evident by comparing the cost of carbons consumed in each type of lamp for one year. Taking carbons at an average cost and figuring on the basis of ten hours' burning per day, the open air arc will consume in one year 300 pairs of carbons, while the Jandus Lamp will consume less than 25 single carbons at a cost of 75 cents, as compared with $12.00 for the open air lamp, thus effecting a saving of over $11.00 per lamp per year. While the actual reduction in the cost of trimming the Jandus Lamp when compared with the open air arcs depends largely on the existing conditions and distribution of the lamps, in most cases it has proven to be greater than the saving in the carbons. The report from one of the large Edison Stations using over 1000 Jandus Lamps, shows a saving of $12.00 per lamp per year. Another large Edison Illuminating Company's records show a saving of $15.00 per lamp per year in carbons, labor and repairs on 1000 Jandus Lamps. Thus it will be seen that the saving effected will alone pay a fair return on the entire cost of an arc lighting plant.

The Jandus Lamp burning as it does directly across the terminals of a circuit without waste of energy, makes a desirable street lighting system where multiple circuits are used and is particularly adapted to the underground system, as lamps can be connected wherever necessary without the inconvenience of running connecting wires between pairs of lamps, or installing two lamps where only one is needed, or wasting the energy of one lamp as was necessary under the old system of connecting two lamps in series.

For interior lighting the economy and convenience of burning lamps singly cannot be overestimated, as individual lamps can be turned on or off when desired, like incandescent lamps or gas jets.

Aside from the saving in carbons and labor of trimming the Jandus Lamp, there are other important advantages over lamps that require trimming every day, especially in large stores where the annoyance of having a step ladder always on the floor is pronounced. The manager of one large department store using over 150 Jandus Lamps, claimed that his floor space was worth $25.00 per sq. ft., and that with his old lamps a step ladder covering 8 sq. ft. was at all times somewhere on the floor blocking the passages and interfering with trade; thus he figures that he has an advantage equal to $200.00 per day by the use of the Jandus Lamps, aside from the saving in carbons and labor.

The enclosure of the arc of the Jandus Lamp in the double globes renders the lamp absolutely danger proof against fire, as it is impossible for sparks to be thrown off. This has caused the lamp to be highly endorsed by the Boards of Fire Underwriters generally. The enclosures also render the lamp perfectly dustless in its operation; thus there is no carbon dust to sift down on the goods during the trimming of the lamps, when placed in stores and warehouses.

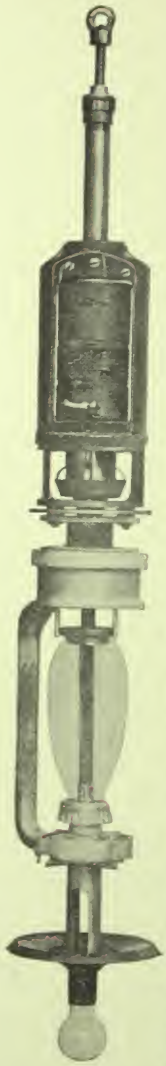


FIG. 3.

Mechanically and electrically the Jandus Lamp differs greatly from any other, since to accomplish the desired results a radical change from existing types was necessary. An examination of Figures 3 and 4 will show how completely the change was made and how boldly the problem was handled. The old constructions containing carbon rods, dash pots and toggle and washer clutches were entirely eliminated, and the extremely simple and substantial structure here illustrated was designed.

Fig. 4 shows the lamp mechanism in section. "A" is the single solenoid connected in series with the arc, and is the only coil used on the lamp.

The armature "B," the magnet frame "C" and the solenoid form an iron clad magnet of great power which enables the use of a heavy armature necessary for good regulation. During the operation of the lamp, the armature "B" disposes itself in a position of equilibrium depending upon the strength of current in "A."

The variations in resistance at the arc cause inverse variations in current strength in "A" and accordingly a change in the position of equilibrium of "B" which, through the medium of the clutch "F," carries the upper carbon and tends to maintain a constant length and resistance of arc.

It will be seen that the action is

simple and direct without the use of intermediate levers or other translating devices.

The armature is the plunger for its own dashpot, formed in a brass tube inside the coil. The carbon (D) extended by a tube or sheath (E) is inserted directly into the clutch, which consists of a pan shaped piece (F) carrying four clutch rings (G). These rings fall by gravity and grip the carbon between the inclined sides of the pan and the carbon. The clutch releases and allows the carbon to feed when the armature has descended until the clutch rings rest upon the releasing tube (H). This form of clutch allows the unequal sizes of the carbons and sheath to be fed through it with equal accuracy. The carbon sheath provides for consuming the carbon without waste, and is just long enough to still remain in the clutch while resting on the top of the globe cap, thus serving as a stop to cut out the lamp when the carbons have been consumed. The current is conducted to the carbon through a series of sixteen contact rings (I) which are arranged in a circle and make a flexible contact with the carbon. One of the great advantages of this absence of a carbon rod is that the current is conducted from the magnet directly to the carbon, and thus if any corrosion is caused at the contact it is produced on the carbon, which is

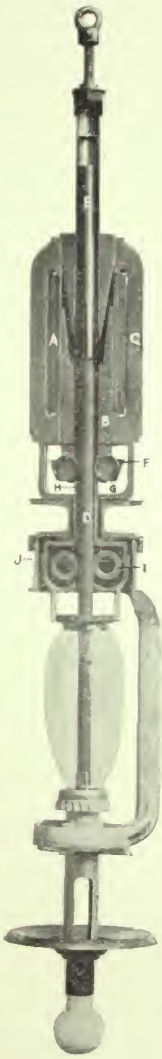


FIG. 4.

renewed with each trimming, and the usual annoyance of a pitted carbon rod is avoided. It will thus be seen that the armature carrying the clutch is the only movable part in the entire mechanism of the lamp, and that there are no springs or adjustments of any description. The yoke (J) supports the inner globe and the lower carbon holder and has at its lower end a ring which admits the arms of the spider carried on the lower holder. This spider by a turn to the right locks the holder in position and closes the electrical circuit through the lamp. The outer globe is secured to the yoke at (J) by a circular nut and is closed air tight at this point by means of asbestos gaskets, and as there are no openings in the lamp body above this point the enclosure is rendered tight with the exception of the bottom opening of the globe. This opening is closed by the pan carried on the lower holder, which fits the ground opening of the globe and is held in position by a spring, thus completing the enclosure, and at the same time allowing for the escape of imprisoned gases, should the pressure become too great inside the globes. The outer globe is thus permanently attached to the lamp and need not be disturbed, as sufficient room is allowed for the occasional necessary cleaning through the bottom opening. The inner globe is secured to the lower holder by a screw device which renders it proof against the escape of gasses at the bottom, while the cap prevents their escape at the top.

This arrangement of globes is covered by our patents and is one of the most important features of the Jandus Lamp. The small inner globe acts as a chamber of high rarefaction for the gas immediately surrounding the arc, while the outer globe acts as a reservoir for the storing of the overflow of the products of combustion formed in the inner globe, and is a sort of intermediate chamber between the inner globe and

the atmosphere, thus preventing the access of the air to the carbon points and protecting them from combustion. There is no exclusion of atmosphere in either globe, until, upon starting the lamp, the oxygen in the small globe is reduced by combustion to carbon monoxide and this, with the chemically inert nitrogen liberated overflows into the outer globe and surrounds the inner chamber to the exclusion of air and doubly protects the carbon points against rapid combustion.

The combustion under this arrangement of globes is very complete, so that the only dirt to be removed at trimming is a thin coating of white ash on the inner surface of the small globe. This can be readily wiped off when the globe is removed to replace the carbon.

Owing to the fact that under normal conditions the relative consumption of upper and lower carbon is nearly constant, we are able so to proportion the lengths of carbons that there is left at each trimming a piece of upper carbon sufficiently long to be used as a lower for the next run. Therefore, it is necessary to use only a single 12 in. carbon for each trim.

INDEPENDENT TESTS of the JANDUS LAMP.

From "The Electrician," of London, April 9th, 1897.

From comparative photometric tests recently taken by the writer, the distribution of light from a 10-ampere direct-current lamp burning 18mm. and 12mm. carbons, with 46 volts across the arc, and fitted with an opaline globe, is plotted out in Fig. 1.

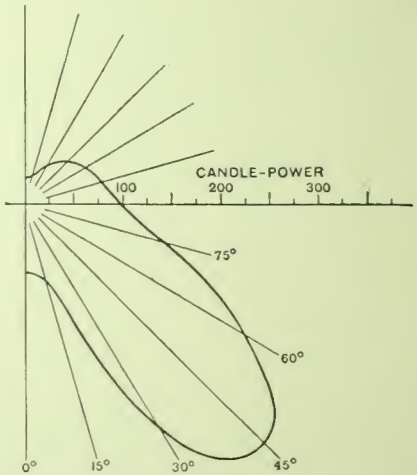


Fig. 1.—Curve of Light from Ordinary Open-air Arc fitted with Opaline Globe.

Similar tests were taken of the emission of light from a "Jandus" enclosed arc lamp, burning 55 amperes with 78 volts at the carbons; the results are shown in Fig. 2.

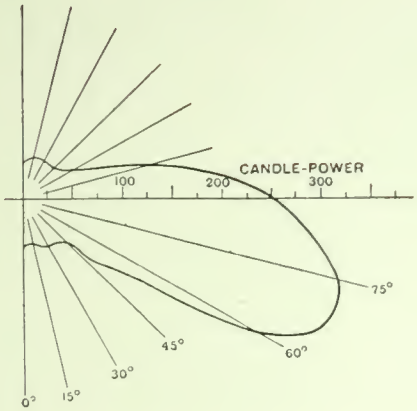


Fig. 2.—Curve of Light from "Jandus" Lamp fitted with inner and outer Globes of Thin Opaline Glass.

Fitted as this was with the inner and outer globes of opalescent glass, the spreading of the rays is less than might have been expected. The intensity of the horizontal flux is partly to be accounted for by the egg-shaped curve of the inner globe, acting as a reflector, and throwing up some of the lower hemispherical beams. Principally, the great advantage is derived from the extreme length of arc, the flatness of the carbon points, and the almost entire absence of hollow crater in the positive carbon.

The effect the improved distribution of light from these lamps will have upon public street lighting will be more readily appreciated from a glance at Fig. 3, where the relative illuminating powers of the two lamps are shown side by side.

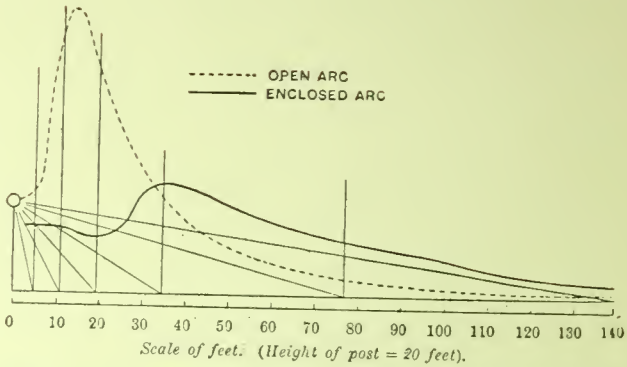


Fig. 3.—Curves showing the Relative Illuminating Powers of "Jandus" and Ordinary Open-Air Arc Lamps taking equal Electrical Energy.

It will be seen from these that, although at close ranges, the light from the open arc is some four times as great as that from the enclosed; at distances beyond two and a half times the height of the arc lamp-post, the "Jandus" gives more than twice the light of the older form of lamp, and regularly maintains the advantage.

This natural effect cannot be too highly appreciated. Engineers having control of the public lamps should carefully guard against a false impression being created by the light intensities immediately about the base of the lamp post. Excessive light here is not required; but at places 25 and 30 feet away, double the illumination of that which was previously to be obtained is of the greatest importance.

From the foregoing considerations it is reasonable to expect the arc lamp of the future will be of air-tight pattern, and will have sacrificed a portion of its carbon diameters—and consequently its hours of burning—for the increased light resulting.

THOMAS HESKETH.

THE JANDUS STANDARD CONSTANT POTENTIAL ARC LAMP

Figure 1 illustrates the Jandus Standard Lamp for out-door service. The case is waterproof and requires no hood, the terminal wires being led out through water-tight rubber bushings. The rheostat is placed below the lower carbon holder inside the outer globe in a position where it will cast no shadow and is thoroughly protected from the weather and is readily accessible. A switch is placed in the waterproof head. This type of lamp is furnished with brass or copper cases; the standard finish is Bauer Barth (black) and the globes are clear outer and clear inner, unless otherwise specified. We furnish the lamp in any style or color of finish desired, in both the brass and the copper, and in any combination of globes desired, including clear, light, medium and dense opal, horizontal or vertical half-ground and full-ground outside globes, and opal, clear and ground inner globes. Lamps can be furnished without individual switches if desired.

Figure 2 illustrates the Jandus Standard Lamp for inside service. The rheostat is placed in the canopy at the top of the lamp where it can be readily adjusted by dropping the top half of the canopy. A cut-off switch is provided in the canopy. These lamps are furnished in any style or color of finish desired, but the standard finish is brush brass, and with the lamps will be furnished opal inner and outer globes unless otherwise specified.

JANDUS DROP GLOBE TYPE CONSTANT POTENTIAL ARC LAMP.

FIG. 5.

The Jandus Lamp can be furnished either with the Standard trim, as shown in Figures 1 and 2, or with the spherical drop globe as shown in Figure 5. This style of trim is the same as is furnished on the twenty-five inch lamp, Figure 7.

SPECIAL DESIGNS AND ORNAMENTATIONS.

Figure 6, shows a Standard Jandus Lamp with ornamental scrolls and special water-proof top for out-door use. This style of ornamentation is furnished only in black, but we have many designs of crowns, scrolls, coronas, etc., in brass and any finish desired.

FIG. 6.

JANDUS TWENTY-FIVE INCH TYPE CONSTANT POTENTIAL ARC LAMP.

We illustrate in Figure 7 the Jandus Twenty-five Inch Type Lamp. While the general features of construction are similar to the Standard Lamp, the mechanism has been changed to meet the requirements of a shorter lamp, which is desirable in many places. This lamp operates without a carbon rod or even a sheath as used in the Standard Lamp. The upper carbon is inserted directly into the clutch of the lamp and makes its electrical connection by means of a contact spring holder that always remains in the lamp. The inner globe is held in its holder in the same manner as in the Standard Lamp and can be removed for convenience in trimming. The outer globe is lowered on rods to allow access to the inner globe and carbons. The holder for securing the outer globe in place is provided with a screw catch that can be easily operated and secures a close fit between the top of the globe and the lamp case regardless of variation in the globes. The top half of the canopy can be lowered to give access to the rheostat for adjusting the voltage of the arc. The cylinder

FIG 7.

enclosing the mechanism can, by turning a button, be lowered for examination of the coils, etc. The outer globe can be quickly removed for replacement if broken, without the use of tools of any description. We furnish this style of lamp for the same voltages and currents, and with the same styles of finish of case and combination of globes as the Standard Constant Potential Lamp. The lamp is furnished for both inside and outside service.

Figure 7 A. shows 25 in. type with shade and screen.

Figure 7 B. shows 25 in. type fitted with waterproof iron case for outside use.

FIG. 7A.

FIG. 7B.

THE JANDUS JUNIOR CONSTANT POTENTIAL ARC LAMP.

FIG. 8.

We show in Figure 8 the Jandus Junior Lamp. This lamp is constructed on the same general lines as the Standard Jandus Lamp, only smaller in dimensions, and modified to meet the demands of small illuminations. The lamp is only twenty-four inches in length, is furnished for any potential from 100 to 125 volts and consumes three amperes. It is the smallest lamp with an outer globe in the market, and is very decorative. These lamps can be placed in groups on electroliers or hung separately, producing very pleasing results. It will be noticed that the consumption of one of these lamps is less than that of six incandescent lamps of ordinary efficiency, while the light produced is far in excess of the incandescents, even when burned at a very soft light, by the use of dense opal globes.

The standard finish of case of this lamp is oxidized brass, but we can furnish any color to order. Any combination of globes can be furnished. We make this lamp for both inside and outside service.

We can furnish for the inside style of this lamp a single brass spinning, finished to match the case, that makes a perfectly ornamental joint between the lamp and standard 1⅛ inch pendant casing, wholly concealing the wires.

The frontispiece shows an electrolier combining one of these lamps with four incandescents. We have grouped them on cluster fixtures for special effects, and have also combined them with gas in the same fixture.

Figure 9 shows the Junior Lamp as furnished to burn without an outer globe by the use of a shade in its stead and by a few minor changes in the arrangement of the bottom mechanism. This makes a desirable lamp for special and decorative purposes.

FIG. 9.

THE JANDUS 3-3½ AMPERE TWENTY-FIVE INCH JUNIOR TYPE ARC LAMP.

FIG. 10A.

This lamp, Figure 10, is designed on the general lines of the twenty-five inch lamp, but with a smaller outer globe. It burns singly across 100–120 volt mains at 80 volt arc and 3–3½ amperes. It is adapted to the same conditions as the Jandus Junior lamp shown in Figures 8 and 9.

JANDUS SERIES-MULTIPLE ARC LAMP FOR RAILWAY AND POWER CIRCUITS.

This type of lamp is a special arrangement of the windings of the Standard Constant Potential Lamp. We have been very successful in the operation of from two in series on 200 volts to six on 600 volts. We can furnish these in both the Standard Jandus method of trimming, and the Drop Globe Style. These lamps are furnished for either inside or outside service, and in the standard finishes and combinations of globes. Adjustment may be made with lamp in service and without interfering with other lamps in the series.

THE JANDUS STANDARD CONSTANT CURRENT ARC LAMP.

The lamp herewith illustrated is designed for the so called 1200 c. p. circuits, 6 to 7 amperes, and as will be observed is identical in appearance with the Jandus Standard Constant Potential Lamp. The magnet, however, is differentially wound and other necessary changes have been made in the mechanism for adaptation to series work.

Simple and effective mechanical and emergency cutouts are provided as also an adjusting coil for the arc potential.

The upper half of the canopy may be lowered, permitting all necessary adjustments. The method of trim is identical with the Jandus Standard trim and the same combination of globes and finish of case prevails.

FIG. 12A.

Fig. 13

Fig. 14.

JANDUS ALTERNATING ARC LAMP.

We illustrate in Figures 13 and 14 the Jandus Alternating Arc Lamp. This lamp is designed to operate on multiple alternating circuits of from 7000 to 16000 alternations and is practically noiseless. The double enclosure principle has been carried out in the design of this lamp and the general outside appearance is quite similar to the Standard Jandus Lamp, but the mechanism has been altered as necessary for operating on alternating circuits. The outer globe slides down on rods for convenience in trimming, and the case around the mechanism can be lowered for examination and adjustment: thus all parts are readily accessible. There is a reactance coil in the canopy which can be furnished for any voltage of circuit between 100 and 120. The lamp operates to the best of advantage at about 70 volts D. P. at the arc, and 6 amperes. The efficiency of the coil is high, showing a loss of but 20 watts. Adjusted as above the total consumption at lamp terminals not exceeding 450 watts.

Lamps may be furnished to consume but 350 watts at terminals if desired.

The carbons are of 8" and 5" lengths so proportioned that the stub of the upper may be used as a lower for the succeeding run, thus requiring but one 8" carbon per trim, or about every 80 to 100 hours of operation.

Lamps for outside service are similar in design to inside lamps, except that they are provided with a waterproof top as shown in Figure 14. The case is brass or copper and the Standard finish is dead black.

Inside lamps permit of any finish desired and are susceptible to highly artistic ornamentation.

The same classification of globes prevails as recommended for our direct current lamps.

Lamps may be fitted with shade instead of outer globe if desired.

SELECTED LIST OF USERS OF THE JANDUS LAMP.

Below is a short list of prominent users of Jandus Lamps in various parts of the country. To some of these we refer by special permission and to all with confidence. The list could be extended to many times the number given and we have hundreds of testimonial letters, copies of which can be obtained upon application. To print full lists and testimonial letters would expand this catalogue beyond reasonable limits.

U. S. Navy Department,	Washington, D. C.
U. S. Capitol,	"
Bureau of Printing and Engraving,	"
Z. D. Gilman,	"
U. S. Naval Training Station,	Newport, R. I.
Norfolk Navy Yard,	Portsmouth, Va.
Girard Estate (Girard College),	Philadelphia
Philadelphia Public Bldg. Commission,	"
Edison Electric Illuminating Co.,	"
Cambria Iron Co.,	Johnstown, Pa.
Rochester Gas & Electric Co.,	Rochester, N.Y.
Rochester Railway Co.,	"
Munsey's Magazine Bldg.,	New London, Conn.
Washburn & Moen Mfg. Co.,	Worcester, Mass.
Metropolitan Electric Co.	Reading Pa.
Manning, Maxwell & Moore,	New York, N. Y.
Metropolitan St. Ry. Co.,	"
New York & Brooklyn Bridge,	"
Lewis-Zukoske Mercantile Co.,	St. Louis, Mo.
Schoenberger Steel Co.,	Pittsburg, Pa.
Edison Electric Illuminating Co.,	Boston, Mass.
Detroit Dry Dock Co.,	Detroit, Mich.
Edison Illuminating Co.,	"
Edison Electric Illuminating Co.,	Easton, Pa.
Standard Oil Co.,	Cleveland, O.
Cleveland Electric Illuminating Co.,	"
Cleveland Electric Ry. Co.,	"
Cleveland Valley & Terminal Ry.,	"
Village of Norwood,	Norwood, O.
Bellaire Steel Co.,	Bellaire, O.
Auditorium Association,	Chicago, Ill.
Chicago Light, Heat & Power Co.,	"
H. H. Kohlsaat,	"
Board of Trade Bldg.,	"
Masonic Temple,	"
Mandel Bros.,	"
W. U. Tel. Co.,	"
University of Michigan,	Ann Arbor, Mich.

Columbus Edison Co.,	Columbus, O.
Columbus Union Station Co.,	"
Ohio State Hospital,	"
Columbus Central Ry. Co.,	"
B & O. S. W. R. R. Co.,	Cincinnati, O.
Grand Hotel,	"
Palace Hotel,	"
Central Railroad of N. J.,	Jersey City, N. J.
Village of Adrian,	Minn.
City of Newton,	Iowa.
Scranton Illuminat'g, Heat & Power Co.	Scranton, Pa.
Woonsocket E. Machine & Pr. Co.,	Woonsocket, R.I.
Callander, McAuslin & Troup.	Providence, R. I.
Liondale Bleaching, Dye & Print W'ks,	Rockaway, N.J.
Paris City Water Works,	Paris, Tenn.
Kirk Building,	Syracuse, N. Y.
Rosenbloom Bros.,	"
Albert Lea Electric Co.,	Minn.
Model Clothing Co.,	Kansas City, Mo.
Larkin Soap Mfg. Co.,	Buffalo, N. Y.
The Wm. Hengerer Co.,	"
Pratt Institute,	Brooklyn, N. Y.
Nassau Electric Ry. Co.,	"
Siegel-Hillman Co.,	St. Louis, Mo.
Imperial El. Lt., Ht. & Pr. Co.,	"
M. H. Pickering Furniture Co,,	Pittsburg, Pa.
R. I. Telephone & Elec. Co.,	Providence, R. I.
Salem Elec. Ltg. Co.,	Salem, Mass.
Boston Market,	Boston, Mass.
Mass. Mechanical Assn.,	"
Newcomb, Endicott & Co.,	Detroit, Mich.
Burnam, Stoepel & Co.,	"
Hahne & Co.,	Newark, N. J.
Electric Supply & Mfg. Co.,	Cleveland, O.
J. L. Hudson & Co.,	"
Hower & Higbee,	"
H. R. Hatch & Co.,	"
H. A. Lozier & Co.,	"
New England Building,	"
Century Building,	"
Hall Safe Co.,	Cincinnati, O.
Valentine Theatre,	Toledo, O.
Peoples Outfitting Co.,	"
Toledo Glass Co.,	"
American Weldless Steel Tube Co.,	"
Chicago & Northwestern Ry. Co.,	Chicago, Ill.
Lyon & Healy Co.,	"
American Gas Engine Co.,	"
Hotel Bismarck,	"
Thos. Emery Sons,	Cincinnati, O.
Plankington Estate,	Milwaukee, Wis.
Pope Manufacturing Co.,	Hartford, Conn.

MAKERS
FENTON & STAIR,
CLEVELAND.